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EXAMINER	
MARTINEZ, BRITTANY M	

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1793	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/520,466	HAYASHI ET AL.	
	Examiner	Art Unit	
	BRITTANY M. MARTINEZ	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 July 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3 and 5-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 5-12* is/are rejected.

7)☒ Claim(s) *3 and 9* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4/6/2009*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Application

Applicants' arguments/remarks and amendments filed July 6, 2009, have been carefully considered. Upon further consideration, the finality of the previous Office action has been withdrawn. **Claims 1-3 and 5-12** are pending in the instant application, with **Claim 3** amended. **Claim 4** has been cancelled. **Claims 1-3 and 5-12** have been examined.

Claim Objections

1. **Claims 3 and 9** are objected to because of the following informalities: it appears as if "silica solid" in **Claim 3** should be "solid silica;" an "a" should be placed before "wet state" in **Claim 3**; and "precipitate" in **Claim 9** should be changed to "precipitated." Appropriate correction is required.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. **Claims 3, 7, 8, 11 and 12** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention.

3. With regard to **Claim 3**, it is unclear whether "a reaction liquid" in the 5th line of the claim is the initial reaction liquid or some other reaction liquid. It is

further indefinite to as whether **Claim 3** produces an easily dispersible cake of precipitated silica, wherein the precipitated silica has a BET specific surface area of at least 220 m^2/g, and wherein when ion-exchange water is added to the easily dispersible cake to provide an aqueous dispersion of the silica with a concentration of 5% by weight, said dispersion being stirred with a propeller mixer to affect a preliminary dispersion, a resultant slurry being treated to be dispersed with a high-pressure homogenizer once at a processing pressure of 78 MPa, and further being diluted to reduce the silica concentration to 1.5% by weight, a resultant dispersion having a light-scattering index (n-value) of at least 2, since these limitations are not present as positive limitations in **Claims 3** and are only referenced in the preamble of **Claim 3**. Still further, it is unclear whether “in a reaction mixture" is referring to the precipitated silica reaction mixture or some other reaction mixture.

4. **Claim 3** recites the limitation "their reaction" in the 8th line of the claim. There is insufficient antecedent basis for this limitation in the claim.

5. With regard to **Claims 7 and 8**, it is indefinite to as whether the claims produce the dispersions of precipitated silica as set forth in the claims from which **Claims 7 and 8** depend since the dispersion of precipitated silica limitations are not present as positive limitations in **Claims 7 and 8** and are only referenced in the preambles of **Claims 7 and 8**.

6. With regard to **Claims 11 and 12**, it is indefinite to as whether the claims produce the coating liquids for ink-jet recording sheets as set forth in the claims from which **Claims 11 and 12** depend since the coating liquid for an ink-jet

recording sheet limitations are not present as positive limitations in **Claims 11 and 12** and are only referenced in the preambles of **Claims 11 and 12**.

Claim Rejections - 35 USC § 102/103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. **Claims 1 and 3** are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Persello (US 5,342,598).

4. With regard to **Claim 1**, Persello discloses an easily dispersible cake of precipitated silica, wherein the precipitated silica has a BET specific surface area of 20 to 300 m^2/g (Persello, "Abstract;" Claims 1 and 15).

5. With regard to **Claim 3**, Persello discloses a process for producing an easily dispersible cake of precipitated silica comprising using an aqueous sodium silicate solution as an initial reaction liquid, simultaneously adding sodium silicate and sulfuric acid to said initial reaction liquid of which pH is being maintained at a fixed value of 8 to 10, and of which temperature is being maintained at a temperature in the range of 60 to 95^{o}C, whereby forming precipitated silica,

wherein a concentration of silica solid in the reaction mixture at the end of the reaction is not higher than 50 g/L; and separating said precipitated silica from said reaction liquid in a wet state (Persello, “Abstract;” c. 3, l. 31-63; c. 4, l. 60-64).

6. With regard to **Claim 1**, while Persello does not explicitly disclose wherein when ion-exchange water is added to the easily dispersible cake to provide an aqueous dispersion of the silica with a concentration of 5% by weight, said dispersion being stirred with a propeller mixer to affect a preliminary dispersion, a resultant slurry being treated to be dispersed with a high-pressure homogenizer once at a processing pressure of 78 MPa, and further being diluted to reduce the silica concentration to 1.5% by weight, a resultant dispersion having a light-scattering index (n-value) of at least 2, this limitation would be anticipated by Persello since Persello discloses the same easily dispersible cake of precipitated silica production process as the instant application. Since the process of Persello and the instant application are the same, the process of Persello would inherently produce the same product as the instant application. **Claim 1** does not require the limitations following "wherein when" in the 4th line of the claim; rather, these limitations are merely circumstantial. Since the process of Persello and the instant application is the same, the product of Persello would inherently have a light-scattering index (n-value) of at least 2 when ion-exchange water is added to the easily dispersible cake to provide an aqueous dispersion of the silica with a concentration of 5% by weight, said dispersion being stirred with a propeller mixer to affect a preliminary dispersion, a resultant slurry being treated

to be dispersed with a high-pressure homogenizer once at a processing pressure of 78 MPa, and further being diluted to reduce the silica concentration to 1.5% by weight.

7. With regard to **Claim 3**, while Persello does not explicitly disclose a pH variation width being +/- 0.3, the teaching by Persello of a constant pH would anticipate this limitation.

8. **Claims 1 and 3** are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Blume et al. (US 6,268,424 B1).

9. With regard to **Claim 3**, Blume discloses a process for producing an easily dispersible cake of precipitated silica comprising using an aqueous media as an initial reaction liquid, simultaneously adding an alkali silicate and a mineral acid to said initial reaction liquid of which pH is being maintained at a fixed value of 7.0 to 10.0, and of which temperature is being maintained at a temperature in the range of 60 to 95^{o}C, whereby forming precipitated silica, wherein a concentration of silica solid in the reaction mixture at the end of the reaction is in the range of 10 to 40 g/L; and separating said precipitated silica from said reaction liquid in a wet state (Blume, Claims 8 and 9).

10. With regard to **Claim 1**, while Blume does not explicitly disclose the precipitated silica having a BET specific surface area of at least 220 m^2/g, and wherein when ion-exchange water is added to the easily dispersible cake to provide an aqueous dispersion of the silica with a concentration of 5% by weight,

said dispersion being stirred with a propeller mixer to affect a preliminary dispersion, a resultant slurry being treated to be dispersed with a high-pressure homogenizer once at a processing pressure of 78 MPa, and further being diluted to reduce the silica concentration to 1.5% by weight, a resultant dispersion having a light-scattering index (n-value) of at least 2, this limitation would be anticipated by Blume since Blume discloses the same easily dispersible cake of precipitated silica production process as the instant application. Since the process of Blume and the instant application are the same, the process of Blume would inherently produce the same product as the instant application. **Claim 1** does not require the limitations following "wherein when" in the 4th line of the claim; rather, these limitations are merely circumstantial. Since the process of Blume and the instant application is the same, the product of Blume would inherently have a BET specific surface area of at least 220 m^2/g and a light-scattering index (n-value) of at least 2 when ion-exchange water is added to the easily dispersible cake to provide an aqueous dispersion of the silica with a concentration of 5% by weight, said dispersion being stirred with a propeller mixer to affect a preliminary dispersion, a resultant slurry being treated to be dispersed with a high-pressure homogenizer once at a processing pressure of 78 MPa, and further being diluted to reduce the silica concentration to 1.5% by weight.

11. With regard to **Claim 3**, while Blume does not explicitly disclose a pH variation width being +/- 0.3, the teaching by Blume of a constant pH would anticipate this limitation.

Claim Rejections - 35 USC § 103

12. **Claim 2** is rejected under 35 U.S.C. 103(a) as being unpatentable over Persello (US 5,342,598) as applied to **Claim 1** above, and further as discussed below.

13. Persello does not explicitly disclose a water content within a range of 83-93% by weight (**Claim 2**)

14. With regard to **Claim 2**, an expected component amount is a result effective variable since one of ordinary skill in the art would expect different properties in the product as such amount varies. Since the component amount is a result effective variable, it is within the ordinary skill of one of ordinary skill in the art to develop a suitable water content. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

15. **Claim 2** is rejected under 35 U.S.C. 103(a) as being unpatentable over Blume et al. (US 6,268,424 B1) as applied to **Claim 1** above, and further as discussed below.

16. Blume does not explicitly disclose a water content within a range of 83-93% by weight (**Claim 2**)

17. With regard to **Claim 2**, an expected component amount is a result effective variable since one of ordinary skill in the art would expect different properties in the product as such amount varies. Since the component amount is a result effective variable, it is within the ordinary skill of one of ordinary skill in

the art to develop a suitable water content. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

18. **Claims 1-3 and 5** are rejected under 35 U.S.C. 103(a) as being unpatentable over Alexander et al. (US 2,601,235).

19. With regard to **Claim 3**, Alexander discloses a process for producing an easily dispersible cake of precipitated silica comprising using an aqueous sodium silicate solution as an initial reaction liquid, simultaneously adding sodium silicate and sulfuric acid to said initial reaction liquid of which pH is being maintained at a fixed value of 9.5 to 10.3, and of which temperature is being maintained at a temperature of 95^{o}C, whereby forming precipitated silica, and separating said precipitated silica from said reaction liquid in a wet state (Alexander, c. 6, l. 38-73).

20. With regard to **Claim 5**, Alexander discloses a dispersion of precipitated silica comprising a dispersion of an easily dispersible cake in a polar solvent, wherein the average particle size of the precipitated silica particles present in said dispersion is in the range of 15 to 130 nanometers, with 93% of the particles having an average diameter in the range of from 18 to 63 nanometers (Alexander, c. 2, l. 1-13; c. 6, l. 38-73; c. 7, l. 1-8).

21. Alexander does not explicitly disclose an easily dispersible cake of precipitated silica, wherein the precipitated silica has a BET specific surface area of at least 220 m^2/g, and wherein when ion-exchange water is added to the easily dispersible cake to provide an aqueous dispersion of the silica with a

concentration of 5% by weight, said dispersion being stirred with a propeller mixer to affect a preliminary dispersion, a resultant slurry being treated to be dispersed with a high-pressure homogenizer once at a processing pressure of 78 MPa, and further being diluted to reduce the silica concentration to 1.5% by weight, a resultant dispersion having a light-scattering index (n-value) of at least 2 (**Claim 1**); a water content within a range of 83-93% by weight (**Claim 2**); variation width being +/- 0.3 (**Claim 3**); a concentration of silica solid in the reaction mixture at the end of the reaction not being higher than 50 g/L (**Claim 3**); nor a ratio of aggregated particles having a particle size equal to or more than 500 nm being not higher than 5% by volume (**Claim 5**).

22. With regard to **Claim 1**, the easily dispersible cake of precipitated silica would be anticipated by Alexander since Alexander discloses substantially the same easily dispersible cake of precipitated silica production process as the instant application. Since the process of Alexander and the instant application are substantially the same, the process of Alexander would inherently produce the same product as the instant application.

23. With regard to **Claims 2 and 3**, an expected component amount is a result effective variable since one of ordinary skill in the art would expect different properties in the product as such amount varies. Since the component amount is a result effective variable, it is within the ordinary skill of one of ordinary skill in the art to develop a suitable water content and solid silica concentration. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

24. With regard to **Claim 3**, while Alexander does not explicitly disclose a pH variation width being +/- 0.3, the teaching by Alexander of a constant pH would anticipate this limitation.

25. With regard to **Claim 5**, an expected ratio of particles of a certain size is a result effective variable since one of ordinary skill in the art would expect different properties in the product as such ratio varies. Since the ratio of particles of a certain size is a result effective variable, it is within the ordinary skill of one of ordinary skill in the art to develop a suitable ratio of aggregated particles having a particular particle size. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

26. **Claims 6-8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Alexander et al. (US 2,601,235) as applied to **Claims 1 and 5** above, and further in view of Kono et al. (US 6,417,264 B1).

27. With regard to **Claims 7 and 8**, Alexander discloses milling dispersions of precipitated silica in order to break-up agglomerates (Alexander, c. 6, l. 5-17).

28. Alexander does not explicitly disclose a cationic polymer (**Claim 6**); a process for preparing a dispersion of precipitated silica comprising subjecting a silica slurry, formed by dispersing the cake of precipitated silica in the polar solvent, to a fine pulverization treatment with a high-pressure homogenizer (**Claim 7**); nor a process for preparing a dispersion of precipitated silica comprising subjecting a liquid premixture, formed by dispersing the cake of

precipitated silica and the cationic polymer in the polar solvent, to a fine pulverization treatment with a high-pressure homogenizer (**Claim 8**).

29. With regard to **Claim 6**, Kono discloses a dispersion of precipitated silica which is characterized by being a dispersion of an easily dispersible cake of precipitated silica in a polar solvent, the average particle size of the precipitated silica particles present in the dispersion being not greater than 200 nm (Kono, c. 2, l. 8-11 and 59-67; c. 7, l. 16-17; "Table 1"), further comprising a cationic polymer (Kono, "Abstract;" c. 1, l. 6-7; c. 2, l. 8-11 and 52-58). Kono further discloses cationic polymer-modified silica dispersions exhibit enhanced optical density and water resistance when used as a coating liquid for ink-jet recording sheets (Kono, c. 1, l. 6-19). Thus, it would have been obvious to one of ordinary skill in the art to modify the product of Alexander with the cationic polymer of Kono in order to obtain a coating liquid for ink-jet recording sheets with enhanced optical density and water resistance.

30. With regard to **Claim 7**, Kono further discloses a process for preparing a dispersion of precipitated silica, in which a silica slurry formed by dispersing a cake of precipitated silica in a polar solvent is subjected to a fine pulverization treatment with a high pressure homogenizer (Kono, c. 4, l. 66-67; c. 5, l. 16-28, 42-48, and 66-67; c. 6, l. 1-3; c. 7, l. 21-24, 35-36, and 45-46; c. 8, l. 54-55). Thus, it would have been obvious to one of ordinary skill in the art to modify the process of Alexander with the high-pressure homogenization of Kono because one of ordinary skill in the art could have pursued the known potential

pulverization options within his or her technical grasp with a reasonable expectation of success.

31. With regard to **Claim 8**, Kono discloses a process for preparing a dispersion of precipitated silica, in which a liquid premixture formed by dispersing a cake of precipitated silica and cationic polymer in a polar solvent is subjected to a fine pulverization treatment with a high pressure homogenizer (Kono, c. 4, l. 66-67; c. 5, l. 16-28, 42-48, and 66-67; c. 6, l. 1-3; c. 7, l. 35-36 and 45-46; c. 8, l. 54-55). Thus, it would have been obvious to one of ordinary skill in the art to modify the process of Alexander with the high-pressure homogenization of Kono because one of ordinary skill in the art could have pursued the known potential pulverization options within his or her technical grasp with a reasonable expectation of success.

32. **Claims 9-12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Alexander et al. (US 2,601,235) as applied to **Claim 1** above, and further in view of Kono et al. (US 6,417,264 B1) and Ichinose et al. (US 2003/0039808).

33. Alexander does not explicitly disclose a coating liquid for ink-jet recording sheets which is obtained by dispersing the easily dispersible cake of precipitated silica of **Claim 1** and a binder in a polar solvent, wherein the percent transmission of the coating liquid, as measured after diluting the same to a silica concentration of 1.5% by weight being at least 20% (**Claim 9**); a cationic polymer (**Claim 10**); a process for making a coating liquid for ink-jet recording sheets comprising dispersing the cake of precipitated silica and a binder in the polar

solvent (**Claim 11**); nor a process for making a coating liquid for ink-jet recording sheets comprising dispersing the cake of precipitated silica, the cationic polymer and a binder in the polar solvent (**Claim 12**).

34. With regard to **Claim 9**, Kono discloses a raw material for a coating liquid for ink-jet recording sheets (Kono, c. 1, l. 10-12) which is characterized by being obtained by dispersing an easily dispersible cake of precipitated silica in a polar solvent (Kono, c. 2, l. 8-11 and 59-67; c. 7, l. 16-17; "Table 1"), and the percent transmission of the raw material for the coating liquid as measured after diluting the same to the silica concentration of 1.5% by weight being at least 20% ("Table 1" and "Table 2"). Thus, it would have been obvious to one of ordinary skill in the art to modify the product of Alexander with the coating liquid for an ink-jet recording sheet use of Kono because one of ordinary skill in the art could have pursued the known potential precipitated silica use options within his or her technical grasp with a reasonable expectation of success.

35. With regard to **Claim 10**, Kono discloses a raw material for a coating liquid for ink-jet recording sheet, which further comprises a cationic polymer (Kono, c. 1, l. 9-12). Kono further discloses cationic polymer-modified silica dispersions exhibit enhanced optical density and water resistance when used as a coating liquid for ink-jet recording sheets (Kono, c. 1, l. 6-19). Thus, it would have been obvious to one of ordinary skill in the art to modify the product of Alexander with the cationic polymer of Kono in order to obtain a coating liquid for ink-jet recording sheets with enhanced optical density and water resistance.

36. With regard to **Claim 11**, Kono discloses a process for making a raw material for a coating liquid for ink-jet recording, which is characterized by dispersing a cake of precipitated silica in a polar solvent (Kono, c. 2, l. 8-11 and 59-67; c. 7, l. 16-17; "Table 1").

37. With regard to **Claim 12**, Kono discloses a process for making a raw material for a coating liquid for ink-jet recording sheet, which is characterized by dispersing a cake of precipitated silica and a cationic polymer in a polar solvent (Kono, c. 4, l. 66-67; c. 5, l. 16-28, 42-48, and 66-67; c. 6, l. 1-3; c. 7, l. 35-36 and 45-46; c. 8, l. 54-55).

38. With regard to **Claims 9, 11 and 12**, Ichinose discloses a coating liquid for ink-jet recording sheets and a process of making, comprising dispersing silica, a binder, and a cationic polymer in a polar solvent (Ichinose, "Abstract;" p. 1, 0002; p. 2, 0025-0026; p. 6, 0059-0060).

39. Thus, it would have been obvious to one of ordinary skill in the art to modify the product and process of the aforementioned applied art with the binder of Ichinose in order to obtain an effective coating liquid for ink-jet recording sheets (Ichinose, "Abstract;" p. 1, 0002).

40. **Claims 1-3, 5 and 7** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hellring et al. (US 6,656,241 B1).

41. With regard to **Claim 3**, Hellring discloses a process for producing an easily dispersible cake of precipitated silica comprising using an aqueous potassium silicate solution as an initial reaction liquid, simultaneously adding

potassium silicate and sulfuric acid to said initial reaction liquid of which pH is being maintained at a fixed value of 8.5, and of which temperature is being maintained at a temperature of 96°C, whereby forming precipitated silica, and separating said precipitated silica from said reaction liquid in a wet state (Hellring, c. 18, l. 56-67; c. 19 - c. 24).

42. With regard to **Claim 5**, Hellring discloses a dispersion of precipitated silica comprising a dispersion of an easily dispersible cake in a polar solvent, wherein the average particle size of the precipitated silica particles present in said dispersion is 29 nanometers (Hellring, c. 21, l. 11-25).

43. With regard to **Claim 7**, Hellring discloses a process for preparing a dispersion of precipitated silica comprising subjecting a silica slurry, formed by dispersing the cake of precipitated silica in a polar solvent, to a fine pulverization treatment with a high-pressure homogenizer (Hellring, c. 4, l. 41-45; c. 18, l. 56-67; c. 19 - c. 24).

44. Hellring does not explicitly disclose an easily dispersible cake of precipitated silica, wherein the precipitated silica has a BET specific surface area of at least 220 m^2/g, and wherein when ion-exchange water is added to the easily dispersible cake to provide an aqueous dispersion of the silica with a concentration of 5% by weight, said dispersion being stirred with a propeller mixer to affect a preliminary dispersion, a resultant slurry being treated to be dispersed with a high-pressure homogenizer once at a processing pressure of 78 MPa, and further being diluted to reduce the silica concentration to 1.5% by weight, a resultant dispersion having a light-scattering index (n-value) of at least

2 (**Claim 1**); a water content within a range of 83-93% by weight (**Claim 2**); variation width being +/- 0.3 (**Claim 3**); a concentration of silica solid in the reaction mixture at the end of the reaction not being higher than 50 g/L (**Claim 3**); nor a ratio of aggregated particles having a particle size equal to or more than 500 nm being not higher than 5% by volume (**Claim 5**).

45. With regard to **Claim 1**, the easily dispersible cake of precipitated silica would be anticipated by Hellring since Hellring discloses substantially the same easily dispersible cake of precipitated silica production process as the instant application. Since the process of Hellring and the instant application are substantially the same, the process of Hellring would inherently produce the same product as the instant application.

46. With regard to **Claims 2 and 3**, an expected component amount is a result effective variable since one of ordinary skill in the art would expect different properties in the product as such amount varies. Since the component amount is a result effective variable, it is within the ordinary skill of one of ordinary skill in the art to develop a suitable water content and solid silica concentration. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

47. With regard to **Claim 3**, while Hellring does not explicitly disclose a pH variation width being +/- 0.3, the teaching by Hellring of a constant pH would anticipate this limitation.

48. With regard to **Claim 5**, an expected ratio of particles of a certain size is a result effective variable since one of ordinary skill in the art would expect different properties in the product as such ratio varies. Since the ratio of particles of a

certain size is a result effective variable, it is within the ordinary skill of one of ordinary skill in the art to develop a suitable ratio of aggregated particles having a particular particle size. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

49. **Claims 6 and 8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hellring et al. (US 6,656,241 B1) as applied to **Claims 1 and 5** above, and further in view of Kono et al. (US 6,417,264 B1).

50. With regard to **Claim 8**, Hellring discloses a process for preparing a dispersion of precipitated silica comprising subjecting a silica slurry, formed by dispersing the cake of precipitated silica in a polar solvent, to a fine pulverization treatment with a high-pressure homogenizer (Hellring, c. 4, l. 41-45; c. 18, l. 56-67; c. 19 - c. 24).

51. Hellring does not explicitly disclose a cationic polymer (**Claim 6**); nor a process for preparing a dispersion of precipitated silica comprising subjecting a liquid premixture, formed by dispersing the cake of precipitated silica and the cationic polymer in the polar solvent, to a fine pulverization treatment with a high-pressure homogenizer (**Claim 8**).

52. With regard to **Claims 6 and 8**, Kono discloses a dispersion of precipitated silica which is characterized by being a dispersion of an easily dispersible cake of precipitated silica in a polar solvent, the average particle size of the precipitated silica particles present in the dispersion being not greater than 200 nm (Kono, c. 2, l. 8-11 and 59-67; c. 7, l. 16-17; “Table 1”), further

comprising a cationic polymer (Kono, "Abstract;" c. 1, l. 6-7; c. 2, l. 8-11 and 52-58). Kono further discloses cationic polymer-modified silica dispersions exhibit enhanced optical density and water resistance when used as a coating liquid for ink-jet recording sheets (Kono, c. 1, l. 6-19). Thus, it would have been obvious to one of ordinary skill in the art to modify the product of Hellring with the cationic polymer of Kono in order to obtain a coating liquid for ink-jet recording sheets with enhanced optical density and water resistance.

53. **Claims 9-12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hellring et al. (US 6,656,241 B1) as applied to **Claim 1** above, and further in view of Kono et al. (US 6,417,264 B1) and Ichinose et al. (US 2003/0039808).

54. Hellring does not explicitly disclose a coating liquid for ink-jet recording sheets which is obtained by dispersing the easily dispersible cake of precipitated silica of **Claim 1** and a binder in a polar solvent, wherein the percent transmission of the coating liquid, as measured after diluting the same to a silica concentration of 1.5% by weight being at least 20% (**Claim 9**); a cationic polymer (**Claim 10**); a process for making a coating liquid for ink-jet recording sheets comprising dispersing the cake of precipitated silica and a binder in the polar solvent (**Claim 11**); nor a process for making a coating liquid for ink-jet recording sheets comprising dispersing the cake of precipitated silica, the cationic polymer and a binder in the polar solvent (**Claim 12**).

55. With regard to **Claim 9**, Kono discloses a raw material for a coating liquid for ink-jet recording sheets (Kono, c. 1, l. 10-12) which is characterized by being

obtained by dispersing an easily dispersible cake of precipitated silica in a polar solvent (Kono, c. 2, l. 8-11 and 59-67; c. 7, l. 16-17; "Table 1"), and the percent transmission of the raw material for the coating liquid as measured after diluting the same to the silica concentration of 1.5% by weight being at least 20% ("Table 1" and "Table 2"). Thus, it would have been obvious to one of ordinary skill in the art to modify the product of Hellring with the coating liquid for an ink-jet recording sheet use of Kono because one of ordinary skill in the art could have pursued the known potential precipitated silica use options within his or her technical grasp with a reasonable expectation of success.

56. With regard to **Claim 10**, Kono discloses a raw material for a coating liquid for ink-jet recording sheet, which further comprises a cationic polymer (Kono, c. 1, l. 9-12). Kono further discloses cationic polymer-modified silica dispersions exhibit enhanced optical density and water resistance when used as a coating liquid for ink-jet recording sheets (Kono, c. 1, l. 6-19). Thus, it would have been obvious to one of ordinary skill in the art to modify the product of Hellring with the cationic polymer of Kono in order to obtain a coating liquid for ink-jet recording sheets with enhanced optical density and water resistance.

57. With regard to **Claim 11**, Kono discloses a process for making a raw material for a coating liquid for ink-jet recording, which is characterized by dispersing a cake of precipitated silica in a polar solvent (Kono, c. 2, l. 8-11 and 59-67; c. 7, l. 16-17; "Table 1").

58. With regard to **Claim 12**, Kono discloses a process for making a raw material for a coating liquid for ink-jet recording sheet, which is characterized by

dispersing a cake of precipitated silica and a cationic polymer in a polar solvent (Kono, c. 4, l. 66-67; c. 5, l. 16-28, 42-48, and 66-67; c. 6, l. 1-3; c. 7, l. 35-36 and 45-46; c. 8, l. 54-55).

59. With regard to **Claims 9, 11 and 12**, Ichinose discloses a coating liquid for ink-jet recording sheets and a process of making, comprising dispersing silica, a binder, and a cationic polymer in a polar solvent (Ichinose, "Abstract;" p. 1, 0002; p. 2, 0025-0026; p. 6, 0059-0060).

60. Thus, it would have been obvious to one of ordinary skill in the art to modify the product and process of the aforementioned applied art with the binder of Ichinose in order to obtain an effective coating liquid for ink-jet recording sheets (Ichinose, "Abstract;" p. 1, 0002).

Additional Prior Art

The following references have not been used in a rejection, but are made of record as applicable prior art:

Reference	Inventor	Publication Date	Citations	Instant Claims
JP 03-045511	Persello	2/27/1991	Abstract	1-3
JP 05-208808 A	McKeown et al.	8/20/1993	¶ 0045-0048	1-3
JP 07-223810 A	Uchiyama	8/22/1995	¶ 0007-0009; 0013-0016; 0021-0024	1-3
US 6,468,493 B1	Chevallier et al.	10/22/2002	Examples 3 & 5	1-3, 5 and 7
US 5,637,636	Cartwright et al.	6/10/1997	Example 1	1-3

Response to Amendments

Applicants' amendments filed July 6, 2009, with respect to the Claims have been fully considered and are accepted.

Response to Arguments

Applicants' arguments filed July 6, 2009, with respect to the rejection(s) of **Claims 1-8** under 35 U.S.C. 103(a) as being unpatentable over Kono in view of Hiroshi and the rejection(s) of **Claims 9-12** under 35 U.S.C. 103(a) as being unpatentable over Kono in view of Hiroshi and Ichinose have been fully considered and are persuasive. Applicants' arguments are persuasive to the extent that Kono discloses a different dispersible cake of precipitated silica production process. Therefore, the rejections have been withdrawn. However, upon further consideration, new grounds of rejection have been made, as discussed above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRITTANY M. MARTINEZ whose telephone number is (571) 270-3586. The examiner can normally be reached Monday-Friday 9:00AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached at (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Wayne Langel/
Primary Examiner, Art Unit 1793

BMM

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